DEVON RIVER AUTHORITY

RIVER EXE SCALE READING INVESTIGATION

5TH ANNUAL REPORT FOR THE 1970 SEASON

The continuing object of this investigation is to examine, by means of scale reading, the biology of age classes of the salmon population of the River Exe. The report is arranged in five sections and tables referred to in the report form an appendix, with the exception of Table 1 which is included in the text on page 2.

A - METHODS

B - THE NET COLLECTION

C - THE ROD COLLECTION

D - GENERAL

E - DISCUSSION

A. METHODS

Scales were collected from fish taken during the normal open seasons which were in 1970:

Nets (1) Upper Reaches - 16th April to 16th August
(2) Lower Reaches - 14th February to 16th August

Rod and Line - 14th February to 30th September.

A weekly close time was in operation for the nets, a period of forty-eight hours from 6 a.m. on Saturday to 6 a.m. on the following Monday.

Eighteen licences were issued for draft or seine nets in 1970. Seventeen were fished in the estuary and one in tidal waters in Exeter. Scale samples were sent in by the netsmen themselves.

Samples from rod caught fish were submitted by anglers, whose continued co-operation is greatly appreciated.

To increase the scale samples from rod caught fish, scales were taken from dead U.D.N. fish found during the fishing season.

Number of Scales Collected

617 (282)	Sets were collected from NET caught fish.
0 (7)	Sets were collected from DISEASED fish in tidal waters.
76 (171)	Sets were collected from ROD caught fish.
148 (229)	Sets were collected from DISEASED fish in fresh water.
841 (689)	Totals for the 1969 season are shown in brackets.

Examination of the Material

The techniques of mounting, projecting and reading the scales were the same as those used in the four previous years.

Some sets of scales were received in the rod sample which could not be accurately read, or the readings could not be used. These were discounted from the totals used for statistical analysis.

B. THE NET COLLECTION

Examination of Table 1 shows that scales were collected from about 29.6% of the fish, declared in the returns as having been landed during the 1970 season.

Sampling efficiency was very good with the exception of August, a noticeable improvement over 1969. It is hoped that netsmen and rodsmen will maintain their sampling efforts particularly in the latter half of the season.

It is hoped that in future years netsmen will be able to provide better samples, for without these the investigation will lose much of its value. It is important for the proper management of stocks in the river, which benefits both netsmen and anglers alike, to find out the proportions in which year classes of salmon run and are caught in season. Also much valuable information is gained of the effects of high seas netting on salmon runs.

TABLE 1 Comparison between Monthly Net Catches Reported and Scale Sample received from Net Caught Fish

Month	No. Caught		Scales Collected		% Sample	
February	44	(50)	4	(15)	9.1	(30.0)
March	167	(101)	58	(30)	34.7	(29.7)
April	230	(234)	71	(87)	30.9	(37.2)
May	305	(328)	87	(51)	28.5	(15.5)
June	542	(308)	214	(40)	39.5	(13.0)
July	618	(459)	155	(59)	25.1	(12.9)
August	181	(-)	28	(-)	15.5	(-)
Total	2,087	(1,480)	617	(282)	29.6	(19.1)

Totals and percentages for 1969 are shown in brackets.

Composition of the Catch

Tables 2, 3, 7 and 9 in the Appendix set out the statistical form of the net collection and from these it can be seen that:-

(i) half the catch consisted of small spring fish.

(ii) Grilse were also well represented in the 1970 collection, as in 1969.

(iii) very few small summer fish were recorded in 1970.

(iv) previous spawners were found in a smaller proportion than in former years.

(v) the largest and smallest fish in each group are comparable with previous years, with the exception of a small grilse of 3 lbs caught in June - this is the smallest fish sampled to date.

Largest and Smallest fish in each year class
(date of capture in brackets)

Year Class	Smallest	Largest
Grilse (1+)	4 fish 3 lbs (June & July '70)	10½ lbs (24.6.70)
Small Spring Fish (2)	2 fish 4¾ lbs (June & July '70)	16¾ lbs (11.3.70)
Small Summer Fish (2+)	5¾ lbs (25.6.70)	15¾ lbs (16.7.70)
Large Spring Fish (3)	12¼ lbs (26.2.70)	18 lbs (30.3.70)
Previous Spawners (Sm)	9¾ lbs (9.3.70)	16½ lbs (25.3.70)

The headings 'Smallest' and 'Largest' refer to weights only.

The average weights of net caught fish are scheduled as follows: (Previous years figures provide a comparison).

	1966	1967	1968
1+	6.0 lbs (15)	6.9 lbs (31)	5.4 lbs (5)
2	8.8 lbs (379)	9.8 lbs (288)	8.8 lbs (119)
2+	10.1 lbs (84)	10.7 lbs (50)	10.2 lbs (3)
3	15.5 lbs (29)	16.9 lbs (57)	13.9 lbs (22)
Sm	10.8 lbs (2)	14.9 lbs (6)	12.0 lbs (10)

	1969	1970
1+	5.6 lbs (68)	5.75 lbs (250)
2	8.3 lbs (189)	8.95 lbs (303)
2+	11.2 lbs (10)	10.29 lbs (52)
3	15.0 lbs (16)	15.0 lbs (7)
Sm	15.4 lbs (6)	12.8 lbs (5)

(The numbers of fish used for calculating the average weights are shown in brackets).

Table 9 shows the monthly catches of fish recorded in Table 1 broken down into the proportions of year classes taken in each month from Table 3.

Time of Run

Table 3 and Figure 2 show distribution of runs of sea-age classes during the season.

The runs of each group are comparable with previous years - small spring fish being predominant, with the run showing from the opening of the season through to July and peaking in May. Grilse were sampled from May to the close of net fishing in July. The minority groups, large spring, small summer and previous spawners, were sampled throughout the same periods as recorded in previous reports.

C. THE ROD COLLECTION

The total known catch by rod and line was 312 salmon. Of the 224 sets of scales in the rod collection 77 were caught by rods and the remaining 147 were taken from U.D.N. fish found dead (in the fishing season) by the bailiffs. The 77 rod caught fish represent 25% of the known catch.

Scales from dead U.D.N. fish, found during the fishing season, were added to the scales from rod caught fish to increase the size of the sample. The U.D.N. part of the sample is shown in brackets in Table 5.

Average Weights of Year Classes

	1966	1967	1968
1+	6.5 lbs (9)	5.7 lbs (5)	4.8 lbs (8)
2	8.4 lbs (354)	9.2 lbs (179)	8.8 lbs (141)
2+	10.2 lbs (5)	7.0 lbs (5)	11.2 lbs (3)
3	14.5 lbs (87)	14.5 lbs (105)	13.1 lbs (33)
Sm	9.0 lbs (1)	12.3 lbs (3)	14.2 lbs (8)

	1969	1970
1+	5.3 lbs (12)	3.5 lbs (1)
2	8.8 lbs (292)	7.9 lbs (197)
2+	10.6 lbs (24)	8.0 lbs (12)
3	14.2 lbs (68)	12.32 lbs (14)
Sm	11.0 lbs (4)	12.1 lbs (10)

(The numbers of each year class in the samples used for calculating the average weights are shown in brackets).

The Smallest and Largest fish in each year class
(date of capture in brackets)

Year Class	Smallest	Largest
Grilse (1+)	3¾ lbs (28.8.70)	
Small Spring Fish (2)	U.D.N. 2½ lbs (17.6.70)	U.D.N. 17 lbs (11.5.70)
Small Summer Fish (2+)	8 lbs (May & Sept. '70)	2 fish only (both U.D.N.)
Large Spring Fish (3)	U.D.N. 10 lbs (20.4.70)	U.D.N. 16 lbs (9.4.70)
Previous Spawners (Sm)	U.D.N. 8½ lbs (18.4.70)	16 lbs (6.3.70)

The headings 'Smallest' and 'Largest' refer to weights only.

Examination of Tables 4 and 5 shows that the largest group of fish caught by anglers was again small spring fish, with large spring fish being the second largest group. Large summer, previous spawners, then grilse, in that order, make up the minority groups.

Table 6 shows the weight/frequency of fish in the rod collection.

Monthly Analysis

Table 5, in which U.D.N. sample is shown in brackets, relates favourably with previous years' results and indicates no significant change.

D. GENERAL

Examination of Tables 7 and 8 shows that, as in previous years, 2-year smolts make up 90% of the sample. The high number of 3-year smolts recorded in 1969 was not repeated in 1970 but dropped to about 3%, this being the percentage found in previous years.

E. DISCUSSION

The results of the scale reading investigation for 1970 show no outstanding changes from previous years' results and more data is required to establish minor trends, etc.

It is hoped to continue the Exe scale reading investigation to monitor possible changes in salmon populations in Devon.

The present investigation attempts to cover only those fish which run into the river and are caught during the normal open seasons.

ACKNOWLEDGEMENTS

The assistance of all rodsmen and netsmen participating in this investigation is greatly appreciated and their continued co-operation

will be most valuable.

REFERENCE

Reports on the four previous seasons work on this river, reports for other rivers and copies of the River Exe Fisheries Survey 1966/67/68/69 are available on application to the Fisheries Officer.

F.J. Nott
Fisheries and Pollution Officer

December, 1971

Devon River Authority,
County Hall,
EXETER,
Devon.

Table (2) Sea-Age Classes and Weights - Nets

Class	Scale Sample	% of Total	Total Wt. of Class (lb)	% of Total
1+	250	40.5	1,438	29.6
2	303	49.1	2,713	55.9
2+	52	8.5	535	11.0
3	7	1.1	105	2.2
Sm	5	0.8	64	1.3
Total	617	100.0	4,855	100.0

Table (3) Monthly Distribution of Sea-Age Classes - Nets

Class / Month	1+	2	2+	3	Sm	Total
February	-	3	-	1	-	4
March	-	50	-	5	3	58
April	-	70	-	-	1	71
May	2	76	8	1	-	87
June	90	95	29	-	-	214
July	130	9	15	-	1	155
August	28	-	-	-	-	28
Total	250	303	52	7	5	617

N.B. These results are drawn in histogram form as % monthly distribution in Fig. (2).

Table (4) Sea-Age Classes and Weights - Rods - & U.D.N. Fish

Class	Scale Sample	% of Total	Total Wt. of Class (lb)	% of Total
1+	1	0.4	3.5	0.2
2	197	87.9	1,552.0	83.2
2+	2	0.9	16.0	0.9
3	14	6.3	172.5	9.2
Sm	10	4.5	121.0	6.5
Total	224	100.0	1,865.0	100.0

Table (5) Monthly Distribution of Sea-Age Classes - Rods - & U.D.N. Fish

Class / Month	1+	2	2+	3	Sm	Total
February	-	19(1)	-	2	1	23
March	-	31	-	3	3	37
April	-	13(64)	-	(7)	(4)	88
May	-	3(64)	(1)	(2)	(2)	72
June	-	(2)	-	-	-	2
July	-	-	-	-	-	0
August	1	-	-	-	-	1
September	-	-	(1)	-	-	1
Total	1	197	2	14	10	224

Figures in brackets are fish found dead with U.D.N.

Table (6) Weights of Rod Caught Fish (including U.D.N. Fish)

Wt. in lbs / Sea-Age Class	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
1+	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
2	1	-	3	12	32	44	52	30	12	4	5	1	-	-	-	1	197
2+	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	2
3	-	-	-	-	-	-	-	-	4	2	4	-	1	2	1	-	14
Sm	-	-	-	-	-	-	1	-	1	2	3	1	-	1	1	-	10
																	224

Table (7) Smolt Ages at Migration - Nets

Sea Age \ Smolt Age	1 year	2 year	3 year
1+	24 (10%)	226 (90%)	-
2	27 (9%)	270 (89%)	6 (2%)
2+	10 (19%)	41 (79%)	1 (2%)
3	-	7 (100%)	-
Sm	-	5 (100%)	-
Total	61 (10%)	549 (89%)	7 (1%)

Table (8) Smolt Ages at Migration - Rods - & U.D.N. Fish

Sea Age \ Smolt Age	1 year	2 year	3 year
1+	-	1 (100%)	-
2	14 (7%)	176 (89%)	7 (4%)
2+	-	2 (100%)	-
3	2 (14%)	12 (86%)	-
Sm	1 (10%)	9 (90%)	-
Total	17 (8%)	200 (89%)	7 (3%)

Table (9) Monthly Catches of Salmon (from Table (1) corrected to show proportions of year classes, using percentage representations from Table (3) - Nets

Month \ Class	1+	2	2+	3	Sm	Total
February	-	33 (75%)	-	11 (25%)	-	44
March	-	144 (86.2%)	-	14 (8.6%)	9 (5.2%)	167
April	-	227 (98.6%)	-	-	3 (1.4%)	230
May	7 (2.3%)	267 (87.4%)	28 (9.2%)	3 (1.1%)	-	305
June	228 (42.1%)	241 (44.4%)	73 (13.5%)	-	-	542
July	518 (83.9%)	36 (5.8%)	60 (9.7%)	-	4 (0.6%)	618
August	181 (100%)	-	-	-	-	181
Calculated Totals	934	948	161	28	16	2,087
%	44.8	45.4	7.7	1.3	0.8	100%

Fig.(1) Grilse (1+) - Nets - Weight Distribution

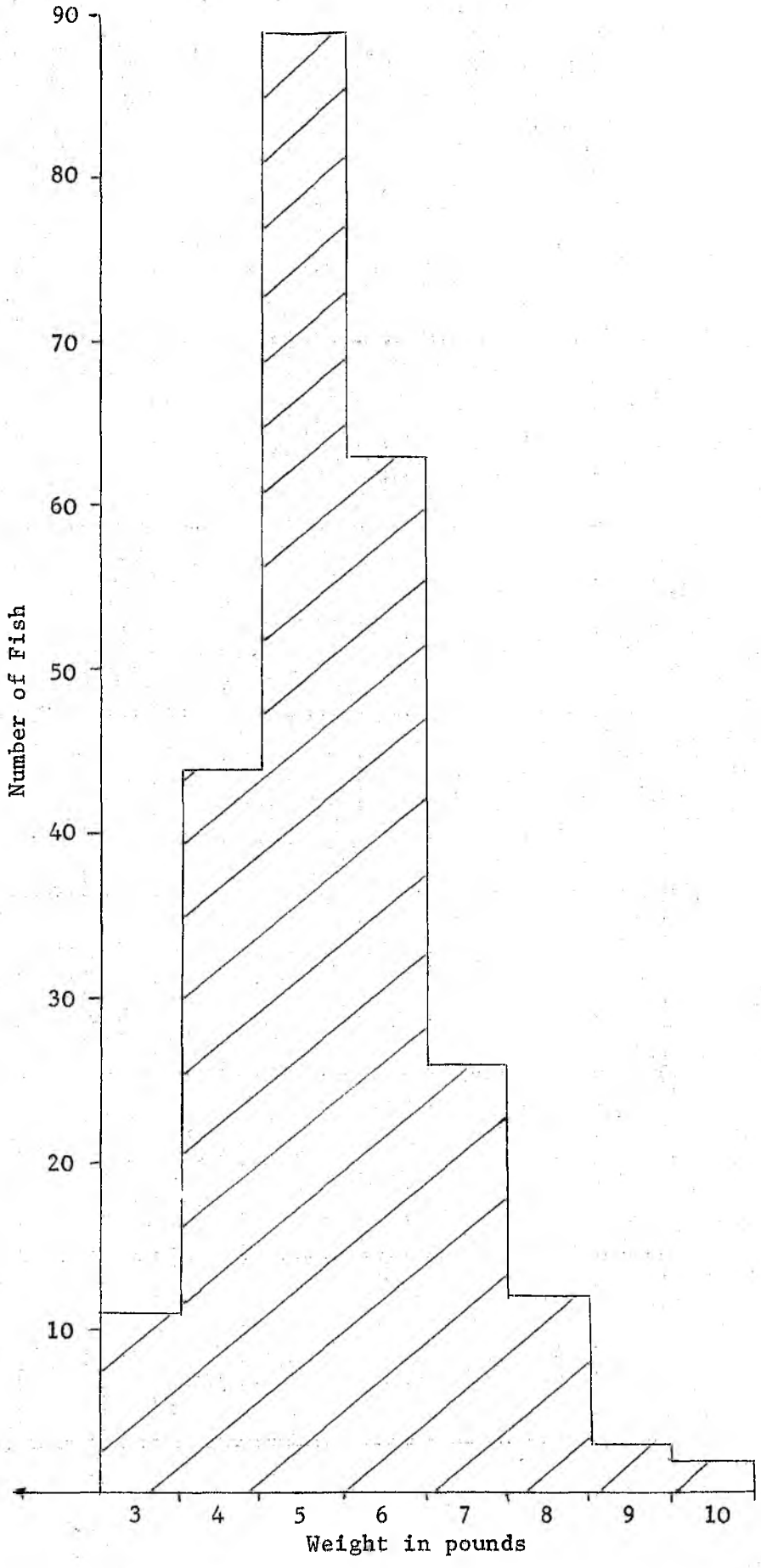

Fig.(2) Small Spring Fish (2) - Nets - Weight Distribution

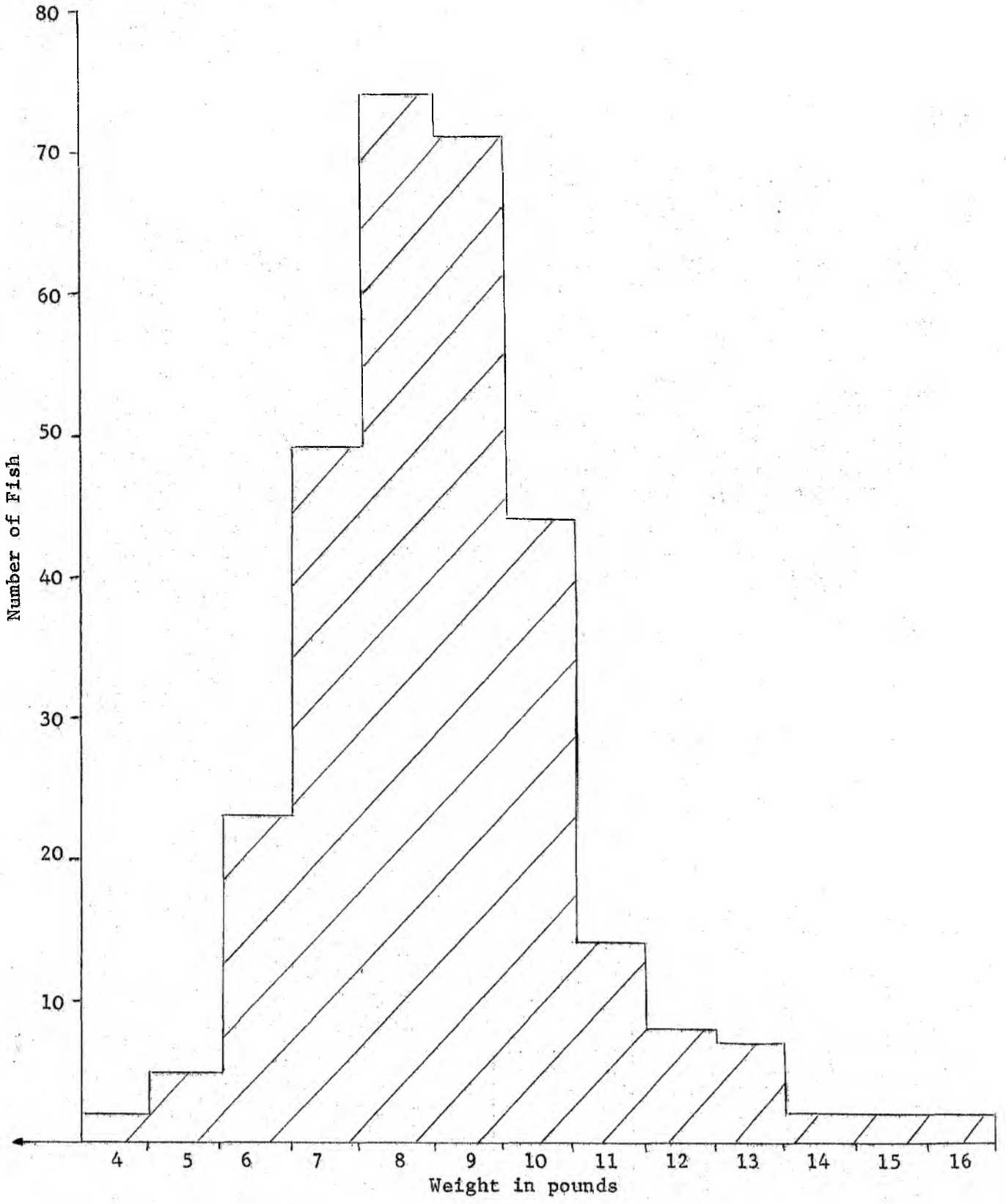

Fig.(3) Percentage Monthly Distribution of Sea-Age Classes - Nets